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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,416	02/19/2004	Paul P. Nguyen	3037P	6354

7590 01/25/2007  
SAWYER LAW GROUP LLP  
P.O. Box 51418  
Palo Alto, CA 94303

EXAMINER
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MENZ, DOUGLAS M

ART UNIT	PAPER NUMBER
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2891

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/25/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/783,416

Applicant(s)

NGUYEN ET AL.

Examiner

Douglas M. Menz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) 8-10 and 12-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 11, 45 and 46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

Claim 45 is objected to because of the following informalities: Claim 45 should end with a period. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Pinarbasi (US 6381106).

Regarding claim 1, Pinarbasi discloses a magnetic element comprising:  
a pinned layer (206, Fig. 13 and Col. 6);  
a spacer layer (202, Fig. 13 and Col. 6), the spacer layer being nonmagnetic; and  
a free layer (304, Fig. 13 and Col. 6) having a free layer magnetization, the spacer layer residing between the pinned layer and the free layer, the free layer including at least one of a doped ferromagnetic material and a multilayer, the doped ferromagnetic material including at least one ferromagnetic material that is diluted with

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at least one nonmagnetic material and/or ferrimagnetically doped such that the free layer has a low saturation magnetization (Abstract and Cols. 5-6);

wherein if the free layer (304, Fig. 13) includes the at least one ferromagnetic material that is diluted with the at least one nonmagnetic material, then the free layer includes at least  $\text{CoFeX}$  where X is B (Col. 6);

wherein the magnetic element is configured to allow the free layer magnetization to be switched due to spin transfer when a write current is passed through the magnetic element (Col. 6).

Regarding claim 2, Pinarbasi further discloses wherein X and Y are at least five atomic percent and less than or equal to sixty atomic percent, except for Pt and Pd which can be in the range of five through eighty atomic percent (Col. 6).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7, 11 and 45-46 are rejected under 35 U.S.C. 102(e) as being anticipated by Saito et al. (US 6781872).

Regarding claim 1, Saito discloses a magnetic element comprising:

a pinned layer (Figs. 12-16 and Cols. 15-16);

a spacer layer, the spacer layer being nonmagnetic (Figs. 12-16 and Cols. 15-16); and

a free layer having a free layer magnetization, the spacer layer residing between the pinned layer and the free layer, the free layer including at least one of a doped ferromagnetic material and a multilayer, the doped ferromagnetic material including at least one ferromagnetic material that is diluted with at least one nonmagnetic material and/or ferrimagnetically doped such that the free layer has a low saturation magnetization (Abstract and Figs. 12-16 and Cols. 15-16);

wherein if the free layer includes the at least one ferromagnetic material that is diluted with the at least one nonmagnetic material, then the free layer includes at least CoX, FeX, CoFeX, NiFeX, CoXY, FeXY, CoFeXY, NiFeXY, and/or CoNiFeXY, where X or Y is Cr, Cu, Au, B, Nb, Mo, Pt, Pd, Ta, Rh, Ru, Ag, TaN, CuN, TaCuN, and/or CoFeX where X is Cr, Cu, Au, Nb, Mo, Pt, Pd, Ta, Rh, Ru, Ag, TaN, CuN, and TaCuN (Figs. 12-16 and Cols. 15-16);

wherein the magnetic element is configured to allow the free layer magnetization to be switched due to spin transfer when a write current is passed through the magnetic element (Figs. 12-16 and Cols. 15-16).

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Regarding claim 2, Saito further discloses wherein X and Y are at least five atomic percent and less than or equal to sixty atomic percent, except for Pt and Pd which can be in the range of five through eighty atomic percent (Figs. 12-16 and Cols. 15-16).

Regarding claim 3, Saito further discloses wherein the free layer includes CoX, FeX, CoFeX, NiFeX, and/or CoNiFeX where X includes at least one rare earth element in a range of five to sixty percent (Col. 15, line: 59 – Col. 16, line: 60).

Regarding claim 4, Saito further discloses wherein the at least one rare earth element is Gd or Tb from five to sixty atomic percent (Col. 15, line: 59 – Col. 16, line: 60).

Regarding claim 5, Saito further discloses wherein the free layer further includes at least one additional dopant, the at least one additional dopant including Cr, Cu, Au, Nb, Mo, Pt, Pd, Ta, Rh, and/or Ru (Col. 16).

Regarding claim 6, Saito further discloses further comprising: a high spin polarization layer residing between the free layer and the spacer layer (Figs. 12-16 and Cols. 15-16).

Regarding claim 7, Saito further discloses wherein the pinned layer includes a plurality of bilayers, each of the plurality of bilayers includes a  $\text{Fexcol-x}$  and a Cu layer, x less than one (Figs. 12-16 and Cols. 15-16).

Regarding claim 11, Saito further discloses wherein X and Y are at least five atomic percent and less than or equal to sixty atomic percent for Cr, Cu, Au, B, Nb, Mo, Pt, Pd, Ta, Rh, Ru, Ag, TaN, CuN, and/or TaCuN and at least five atomic percent and less than or equal to eighty atomic percent for Pt and Pd (Figs. 12-16 and Cols. 15-16).

Regarding claim 45, Saito further discloses wherein the free layer includes the at least one ferromagnetic material that is diluted with at least one nonmagnetic material, then the free layer includes at least  $\text{CoX}$ ,  $\text{FeX}$ ,  $\text{NiFeX}$ ,  $\text{CoXY}$ ,  $\text{FeXY}$ ,  $\text{CoFeXY}$ , and/or  $\text{CoNiFeXY}$ , where X or Y is Cr, Rh, Ru, TaN, CuN, TaCuN, and/or  $\text{CoFeX}$  where X is Cr, Rh, Ru, TaN, CuN, and TaCuN (Cols. 15-16).

Regarding claim 46, Saito further discloses wherein the free layer includes a plurality of bilayers, each of the plurality of bilayers includes a  $\text{FexCo}_{1-x}$  and Cu layer, x less than one (Cols. 15-16, *five layered structure*).

### ***Response to Arguments***

Applicant's arguments filed 11/7/06 have been fully considered but they are not persuasive. Applicant argues that Pinarbasi does not disclose the free layer as claimed.

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Examiner disagrees. Pinarbasi explicitly discloses both a multilayer structure as the free layer (*see Abstract*) and a CoFe free layer doped with Boron (*see Abstract*).

Applicant then argues that Pinarbasi does not disclose wherein the magnetic element is configured to allow the free layer magnetization to be switched due to spin transfer when a write current is passed through the magnetic element, instead teaches that an external magnetic field switches the free layer magnetization. Examiner disagrees. If Pinarbasi's structure is configured such that an external magnetic field switches the free layer magnetization, then the free layer magnetization would also be switched when a write current is passed through the magnetic element. This is how Spin Valves work.

Applicant also argues that Saito does not disclose the claimed free layer material in combination with the free layer magnetization to be switched due to spin transfer when a write current is passed through the magnetic element. Applicant further states that Saito's structure is directed to magnetic memories. Saito clearly discloses the free layer structure (*see Cols. 15-16*) and further that the magnetic recording layer of the memory **is the free layer** (*see Cols. 15-16*).

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not



mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas M. Menz whose telephone number is 571-272-1877. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DM

*Doug Menz* 1/21/07  
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